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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,827	06/24/2005	Chaonan Xu	20441/0202804-US0	2186

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EXAMINER	
GREEN, TRACIE Y	

ART UNIT	PAPER NUMBER
2809	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,827	XU ET AL.	
	Examiner	Art Unit	
	Tracie Y. Green	2809	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,10 and 11* is/are rejected.

7)☒ Claim(s) *7-9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *07/19/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Yoshimura et al (U.S. Patent 6,099,753).

Yoshimura et al discloses a plasma display panel comprising:

Regarding claim 1,

A. A phosphor layer between a pair of opposing substrates; (Column 3, lines 8-11)

B. A said phosphor layer emitting light through excitation by vacuum ultraviolet radiation; said phosphor layer containing spherical fine particles of a luminescent material that is excited by vacuum ultraviolet radiation (VUV). (Column 4 lines 7-10 and Figure 2, #4,5)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 2-3,5,6 and 10-11are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura et.al in view of Hampden-Smith et al (U.S. patent 6,180,029).

Yoshimura et al's invention discloses all of the claimed limitations from above except for wherein: said VUV-excited luminescent material is fine particles of a perfect sphere-shape; wherein: said VUV-excited luminescent material is fine particles of a perfect sphere-shape; Eu; a reaction step in which a metal ion solution of VUV-excited luminescent material is atomized and formed into spherical fine particles under a heated atmosphere of 500-1500 degrees C, a baking step in which said spherical particles formed in said reaction step are heated to a temperature greater than in said reaction step; said heating temperature of said baking step is 1000-1700 degrees C; wherein: in said reaction step; wherein: NH4BF4 is added as said fluxing agent; which emits light through excitation by vacuum ultraviolet radiation; said VUV-excited luminescent material being fine particles of perfectly spherical shape; a reaction step in which a metal ion solution containing a matrix substance and an activator which constructs said VUV-excited luminescent material is atomized and formed into spherical fine particles under a heated atmosphere of 500-1500 degrees C and a baking step in which said

spherical particles formed in said reaction step are heated to a temperature greater than said reaction step.

However, Hampden-Smith et al teaches

Regarding claim 2, wherein: said VUV-excited luminescent material is fine particles of a perfect sphere-shape (Column 2, lines 6-15 and Figure 59)

Regarding claim 3, wherein: said VUV-excited luminescent material has a particle size of 2 micrometers or less (Column 6, lines 1-5 and Figure 59)

Regarding claim 5

A. A reaction step in which a metal ion solution of VUV-excited luminescent material is atomized and formed into spherical fine particles under a heated atmosphere of 500-1500 degrees C; (Column 26, lines 5-10)

B. A baking step in which said spherical particles formed in said reaction step are heated to a temperature greater than in said reaction step. (Column 26, lines 6-15)

Regarding claim 6, said heating temperature of said baking step is 1000-1700 degrees C. (Column 16, lines 4-5)

Regarding claim 10, which emits light through excitation by vacuum ultraviolet radiation; said VUV-excited luminescent material being fine particles of perfectly spherical shape. (Column 2, lines 1-5)

Regarding claim 11,

A. A reaction step in which a metal ion solution containing a matrix substance and an activator which constructs said VUV-excited luminescent material

is atomized and formed into spherical fine particles under a heated atmosphere of 500-1500 degrees C; (Column 31, lines 1-5)

B. A baking step in which said spherical particles formed in said reaction step are heated to a temperature greater than said reaction step. (Column 26, lines 6-15)

5. Given the teachings of Hampden-Smith et al it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the plasma display of Yoshimura et al with said VUV-excited luminescent material is fine particles of a perfect sphere-shape; wherein: said VUV-excited luminescent material is fine particles of a perfect sphere-shape; a reaction step in which a metal ion solution of VUV-excited luminescent material is atomized and formed into spherical fine particles under a heated atmosphere of 500-1500 degrees C, a baking step in which said spherical particles formed in said reaction step are heated to a temperature greater than in said reaction step; said heating temperature of said baking step is 1000-1700 degrees C; wherein: in said reaction step, a fluxing agent or thickener is further added to said metal ion solution; wherein: said VUV-excited luminescent material being fine particles of perfectly spherical shape; a reaction step in which a metal ion solution containing a matrix substance and an activator which constructs said VUV-excited luminescent material is atomized and formed into spherical fine particles under a heated atmosphere of 500-1500 degrees C and a baking step in which said spherical particles formed in said reaction step are heated to a temperature greater than said reaction step.

Doing so would provide would provide material that has good crystallinity and an improved method for forming such oxygen-containing phosphor and incorporating it into devices.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimura et al in view of Hampden-Smith et al as applied to claim(s) above, and further in view of Zachau et al (U. S. Patent 5,714,835).

Yoshimura et al 's invention as modified by Hampden-Smith et al discloses all of the claimed limitations from above except for wherein: said VUV-excited luminescent material is a BAM-type luminescent material represented by $BaMgAl_{10}O_{17}$

However, Zachau et al teaches,

Regarding claim 4 as dependent from claims 2 and 3, wherein: said VUV-excited luminescent material is a BAM-type luminescent material represented by $BaMgAl_{10}O_{17}$: Eu.

7. Given the teachings of Zachau et al it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the plasma display panel of Yoshimura et al with wherein: said VUV-excited luminescent material is a BAM-type luminescent material represented by $BaMgAl_{10}O_{17}$

Doing so would provide to a device with a luminescent material that can be better excited by VUV-radiation and emit light better light in the optical spectrum.

Allowable Subject Matter

8. Claims 7, 8, as dependent on claim 5,6 or 7, and 9 as dependent on claim 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure are cited in form 892 of this office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracie Y. Green whose telephone number is 571/270-3104. The examiner can normally be reached on Monday-Thursday- 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrell McKinnon can be reached on 571/272-4797. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tracie Green
June 21, 2007

TERRELL L. MCKINNON
SUPERVISORY PATENT EXAMINER